



**north dakota**  
**GEOGRAPHIC INFORMATION SYSTEMS**

# Using GIS for Rural Tax Assessment

## *GIS Functionality & Capabilities*

**North Dakota GIS Users Group 2007  
Conference  
September 11-13, 2007**

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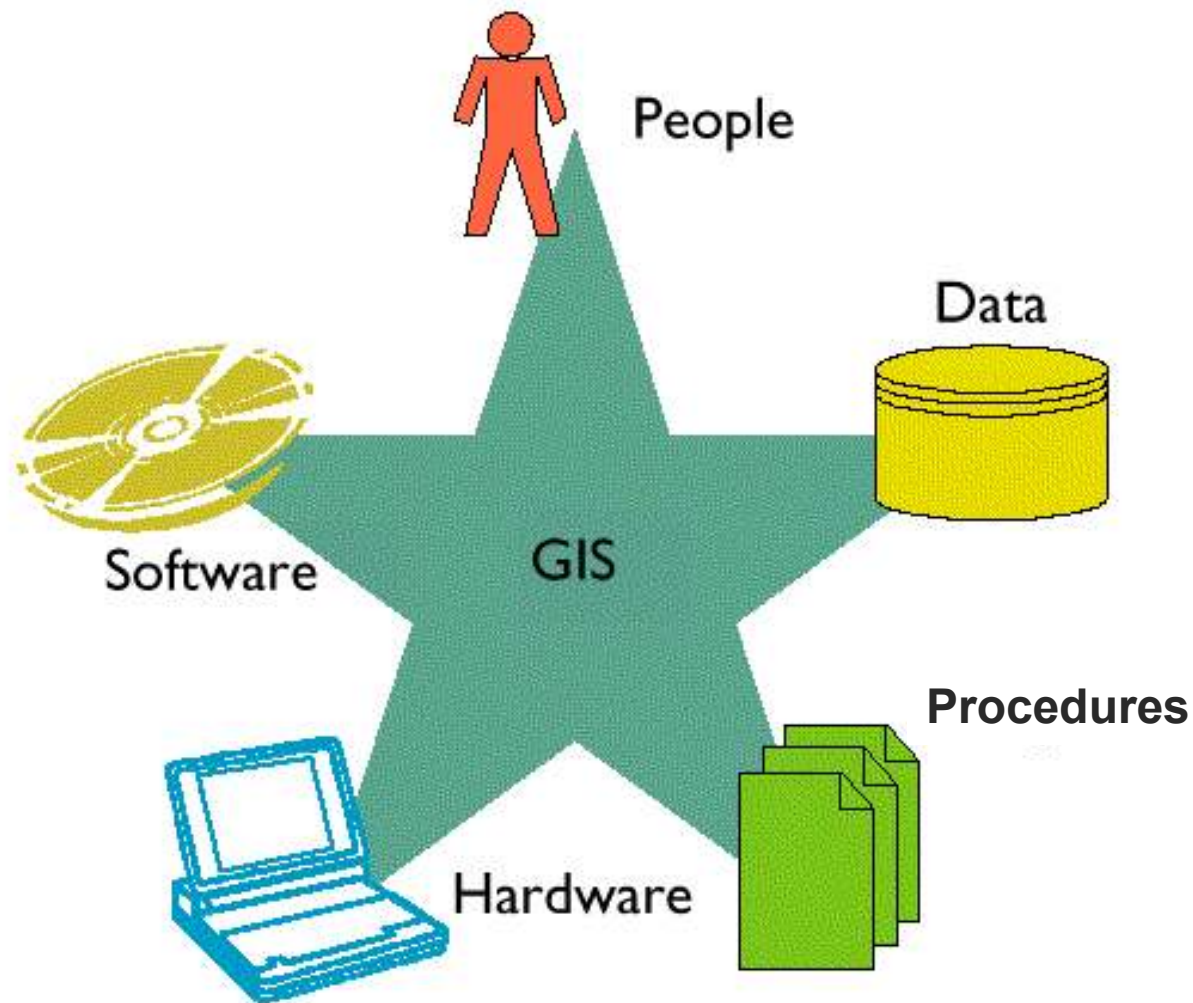
- **GIS for Rural Tax Assessment**
  - Why should you Implement GIS?
  - Basics & Benefits
  - Capture & Store
  - Query & Analyze
  - Display & Report
- **Creating your GIS**
  - Planning & Scoping
  - Preparing & Collecting
  - Maintaining
  - Accessing
- **Questions**

# GIS for Rural Tax Assessment

## *Basics & Overview*



## An integration of 5 basic components

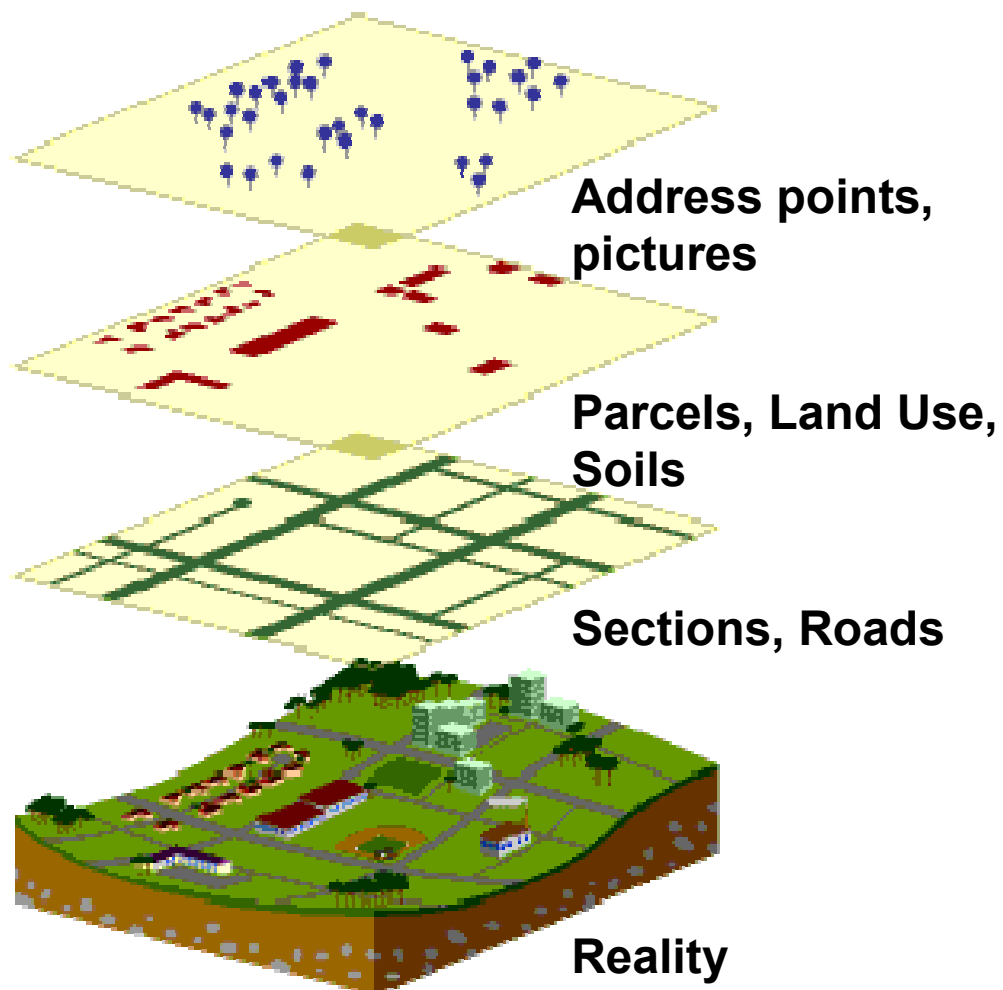




**Capture  
&  
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**Query  
&  
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**Display  
&  
Report**





## ***Better Organization and Security...***

- Traditional hardcopies are easily lost, misfiled, or misplaced

## ***Data is Easier to Search and Analyze with GIS...***

- Can answer “What is nearby?” and “What is in this area?” questions easily
- New types of studies made possible
- Make GIS transparent for users...focus on using the data

## ***Increased Efficiency...***

- Become data and Information rich
- Eliminate redundancies
- Streamline processes
- Improve collaboration
- Reduce expenses

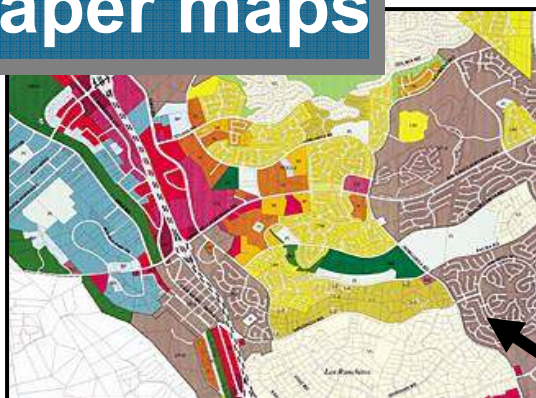
## ***Greater Flexibility...***

- Traditional paper maps are static...
- GIS can produce maps on the screen or paper at any scale, covering any area, at any level of detail

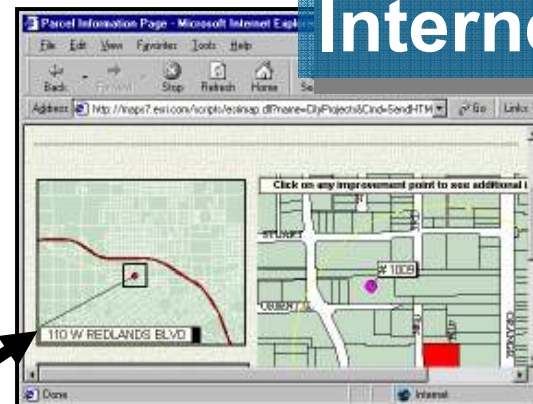




Paper maps



Internet

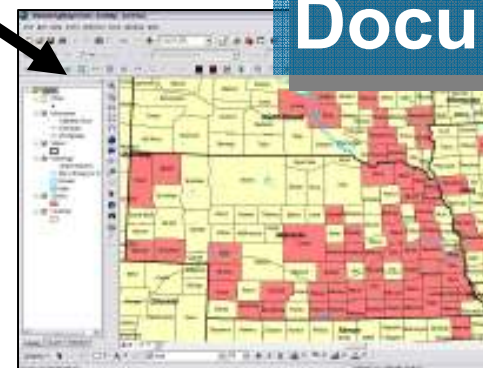


GIS  
Data

Imagery



Document



- **Franklin County Assessor GIS**
  - Viewing parcel/annotation, land use, soils, PLSS, and imagery
- **Platte County Assessor GIS**
  - Viewing parcels, oblique photos
  - Viewing scanned cadastrals in background





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## **Digital Map Maintenance:**

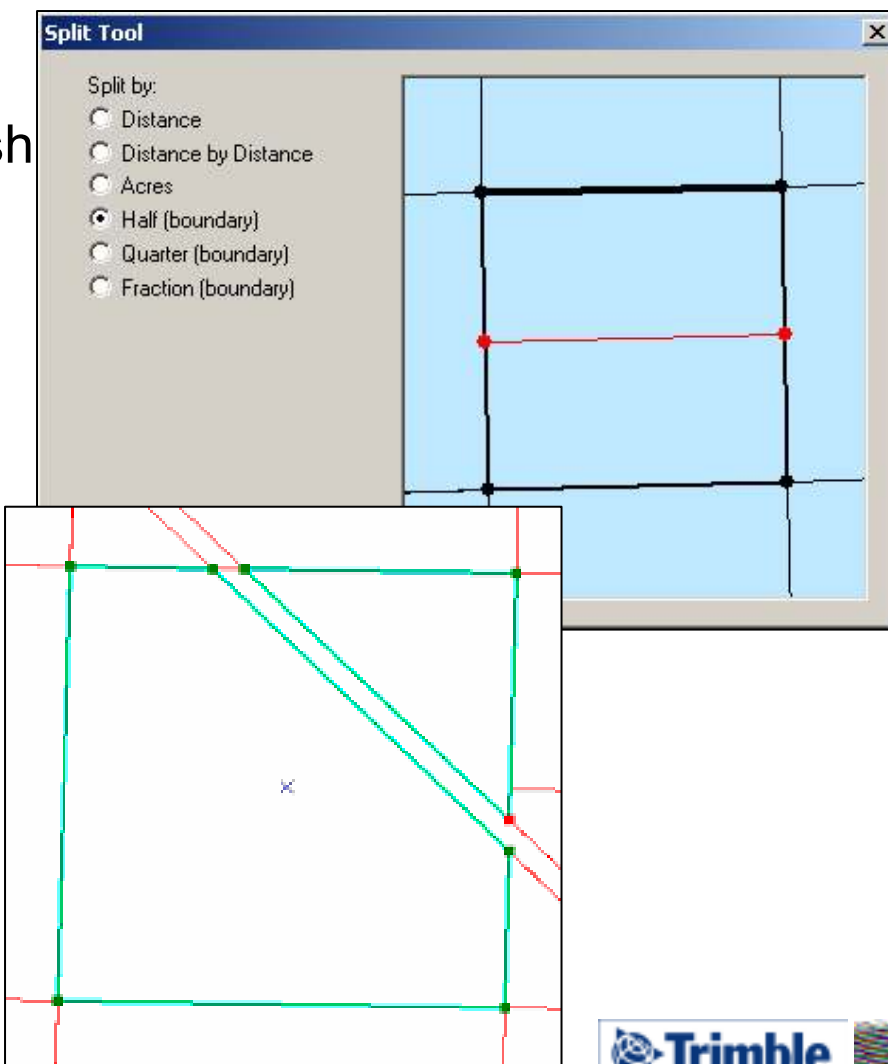
- Simple Splits and Aliquot parts
  - Splits & Quarters
  - Merging Parcels
  - Lot Building
- Advanced Editing
  - Meets and Bounds
  - Incorporating Survey data directly
- CAD files
  - Bringing in CAD surveys from surveyors
  - Using scanned images & files





## Simple Splits for parcel maintenance:

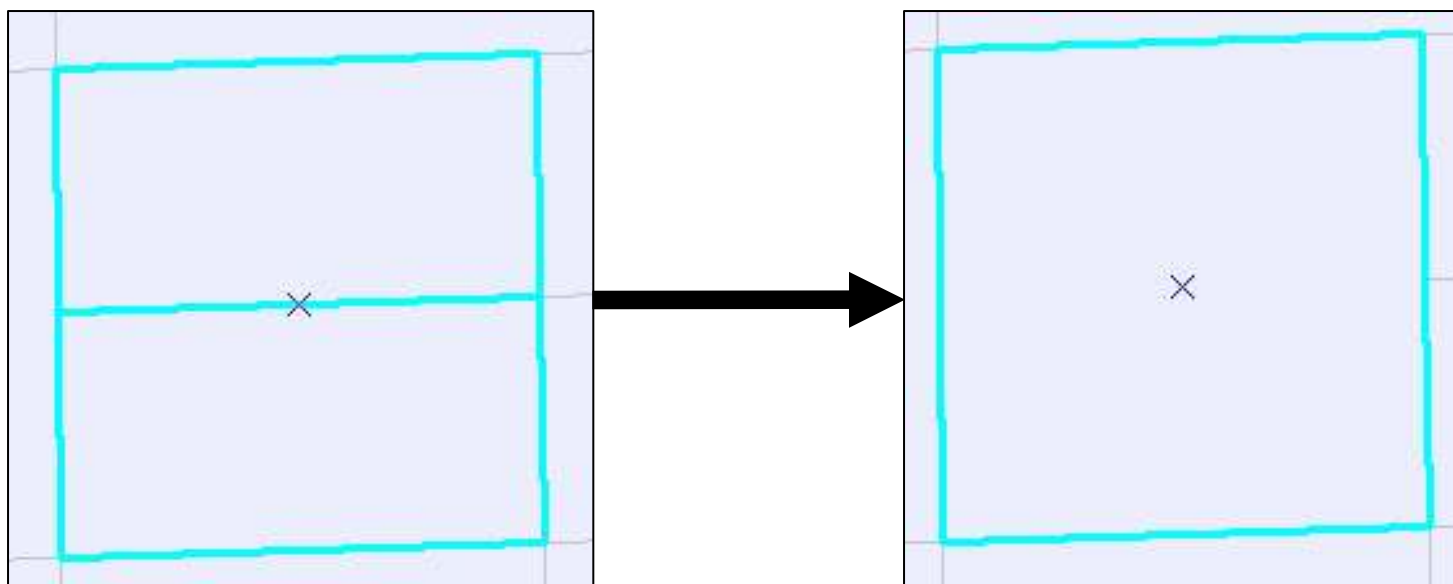
- GIS improves accuracy
  - Split parcels exactly as you wish
    - Half
    - Quarter
    - By percentage
    - By Acres
    - By Dimensions
  - Ensures equitable assessment
  - Improves analysis





## Merge multiple parcels quickly and easily:

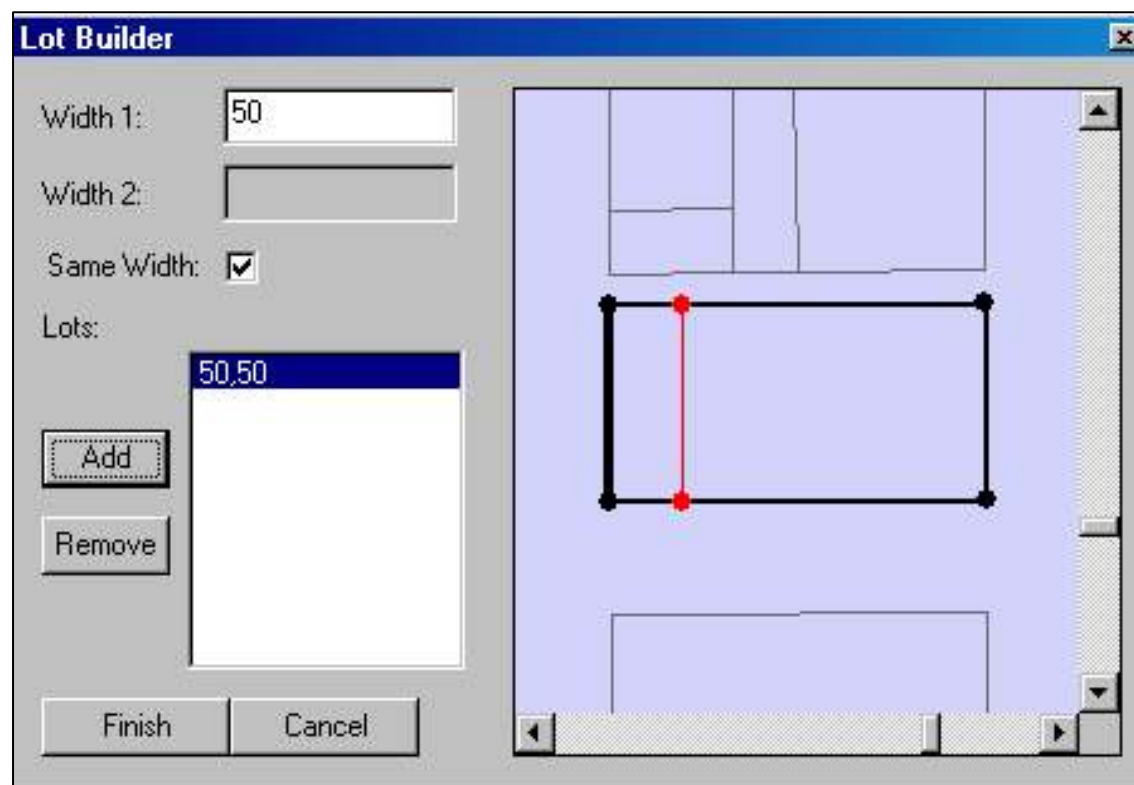
- GIS allows for quick combination of adjacent parcels
  - Quickly merge parcels together
  - Improves analysis capabilities





## GIS allows for quick development of multiple lots:

- Ability to create multiple lots simultaneously in urban areas
- Demonstration





## Bring survey information into GIS:

- Use Coordinate Geometry (COGO) to create/maintain parcel data as identified in simple surveys
  - Create points based on simple surveyor distance and direction
  - Integrates directly into GIS
  - No more guessing involved

**Cogo Direction/Distance**

Direction:      Distance:

Directional Offset:  Scale Factor:

Input: Dir dd mm ss.sss Dir

**Cogo Direction/Distance**

Direction:      Distance:

Directional Offset:  Scale Factor:

Input: x.x



## Bring survey information into GIS:

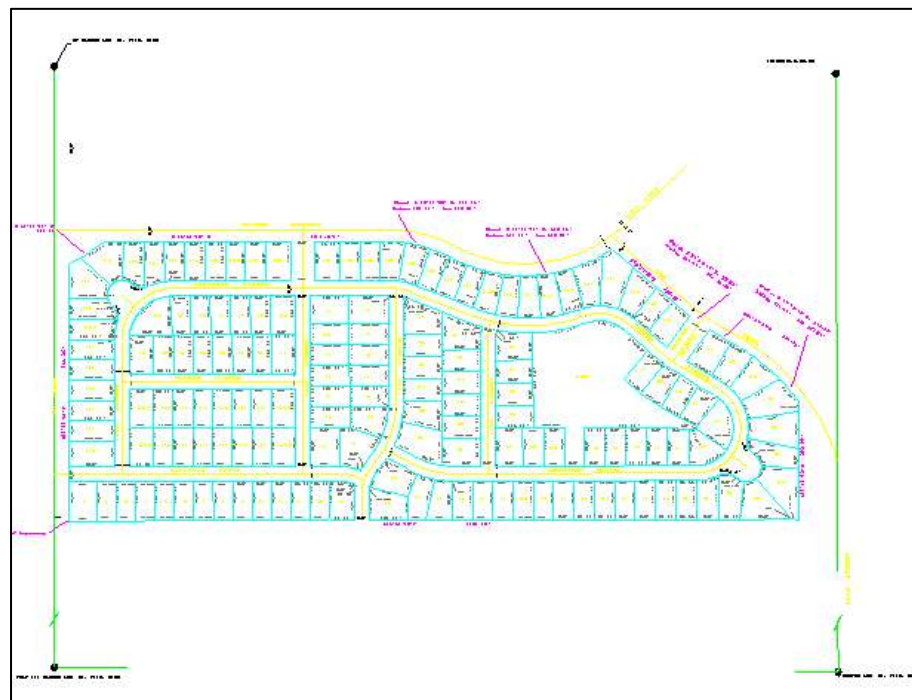
- Ability to use:
  - Direction Distance
  - Angle Distance
  - Deflection Distance
  - Curves
  - Tangent Curves
- Demonstration

#	Description
1	Straight Direction: S90-15-10W Distance: 300



## Integrate CAD information into GIS:

- Bringing in a CAD survey from your surveyor
  - GIS allows for data interoperability





- **Lyman County, SD Tax Equalization GIS**
  - Performing basic maintenance (Splits, Quarters, Lot Building, Simple & Advanced Surveys)
- **Polk County, NE Assessor GIS**
  - Viewing CAD files in GIS

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&  
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## Querying & Analyzing Data:

- Identify using Attributes
  - PID, Section-Township-Range, etc.
- Basic Analyses
  - Linking to CAMA data
- Advanced Analyses
  - Land Value Calculations

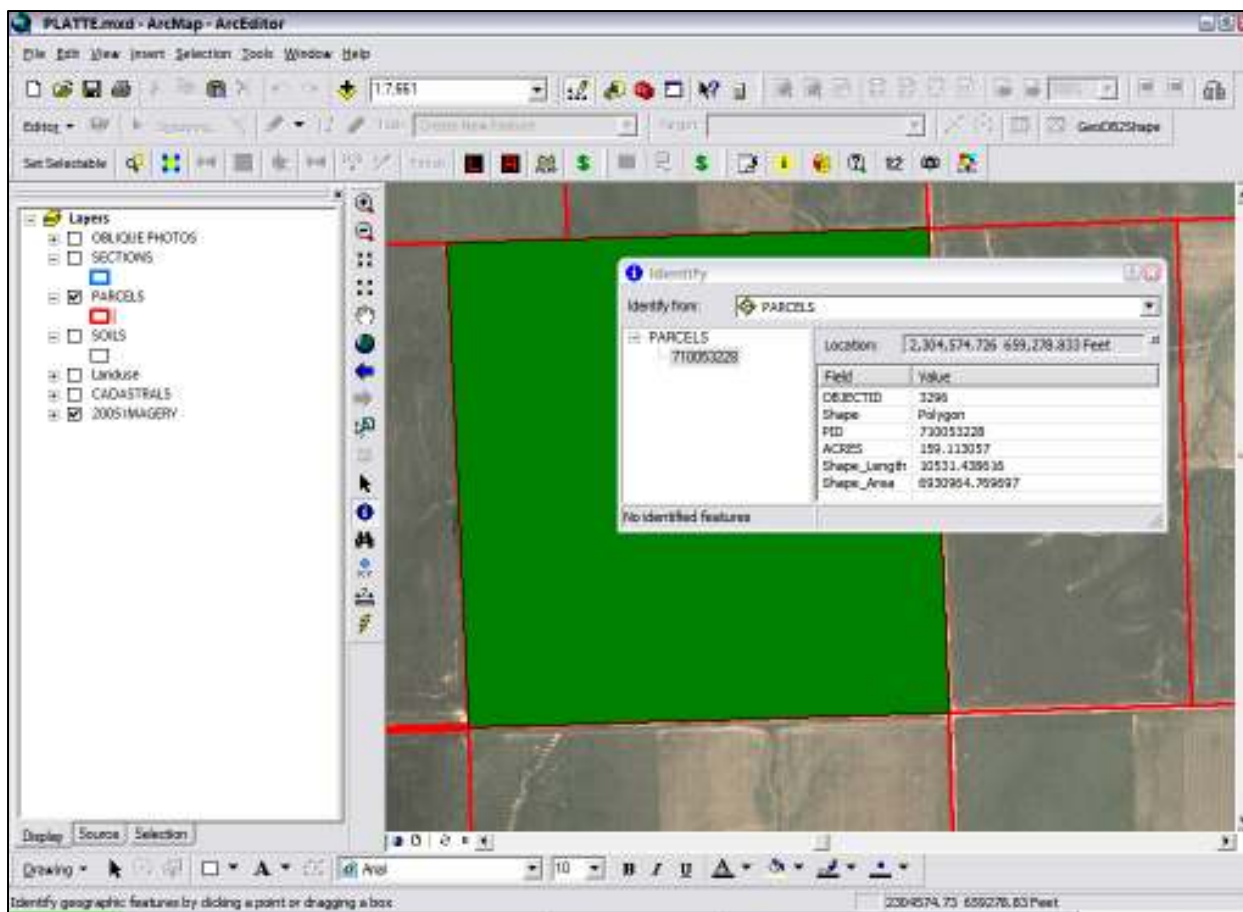
## Using the GIS for Analysis:

- Identify & locate parcels by
  - Parcel Identification Number
  - Section, Township, Range
  - Visual inspection with imagery
- Linking to the CAMA/Appraisal Package
  - Perform simple and advanced queries on the CAMA/Appraisal data from the GIS
- The BIG ONE: Land Value Calculations



## Perform basic queries in GIS quickly & easily:

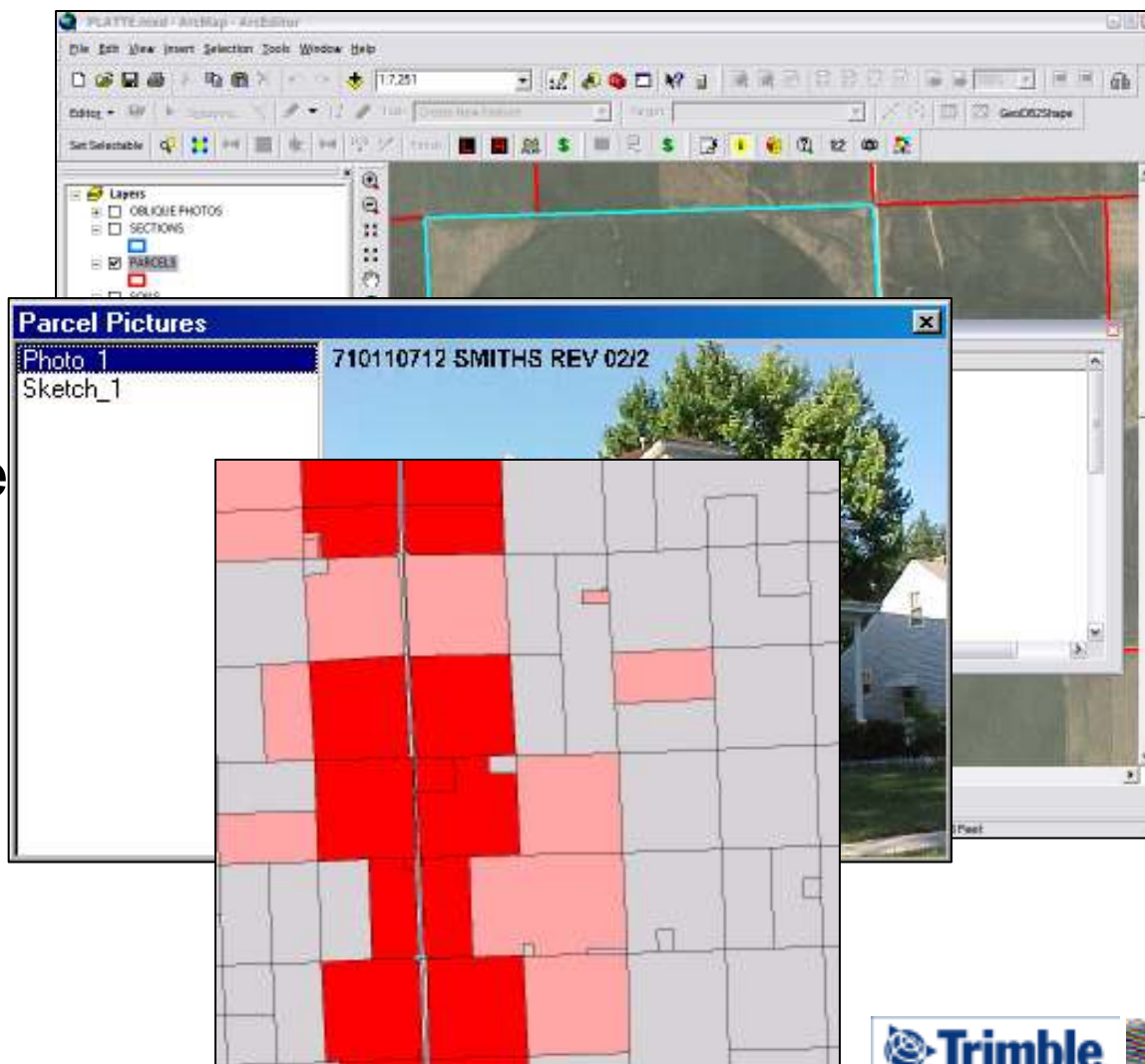
- Identify & locate parcels by:
  - Parcel Identification Number
  - Section, Township, Range
  - Visual inspection with imagery
- Get basic info:
  - Acres, etc.





## Linking directly to CAMA/Appraisal Data:

- Enhance reporting & analysis
- Identify parcels with advanced info
- Query the CAMA / Appraisal database to find parcels in the GIS
- View Pictures & Sketches
- Create thematic maps for reports



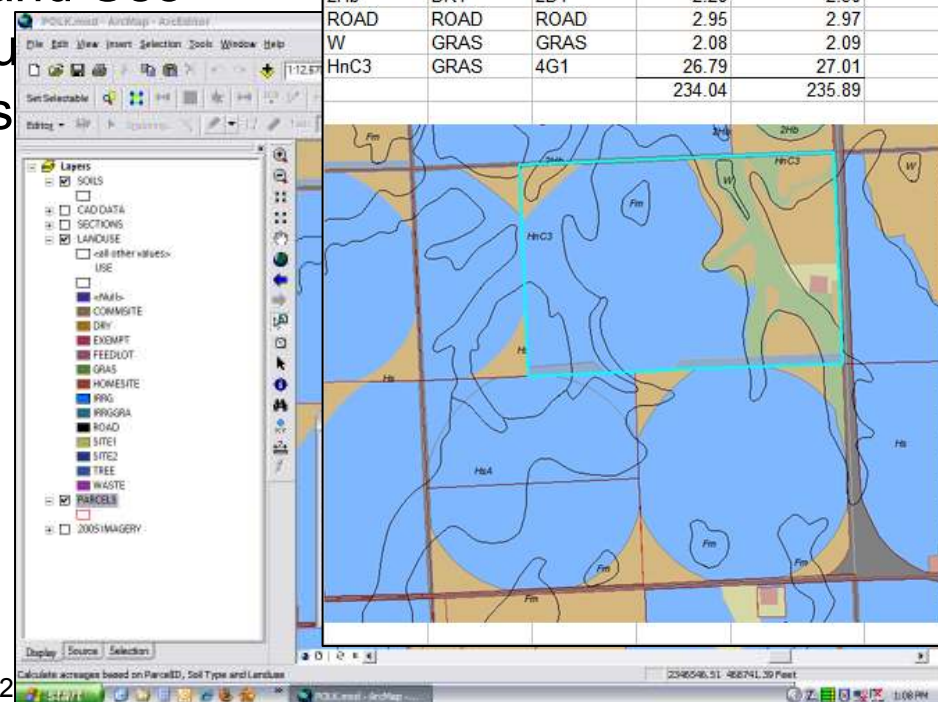




## Land Value Calculations:

- GIS can automate the Land Valuation Process
- 3 pieces to ND Rural Tax Assessment:
  - Utilizes Parcels, Soils, and Land Use modifiers to accurately measure acreage
- Generate Tables to print or save
- Counties can utilize GIS or Deeded acreage in determining valuations

PARCEL ID: 720001155					
CURRENT OWNER: REFFITT/DEBORAH A (ET AL, TTEES					
LEGAL DESCRIPTION: NE1/4 & E1/2 NW1/4 21-13-1 (235.89 ACRES)~					
Soil Code	Landuse	LVG Code	GIS Acres	Deeded Acres	
Hs	TREE	1T1	6.24	6.29	
HnC3	TREE	4T1	2.36	2.38	
Hs	GRAS	1G1	2.67	2.69	
HnC3	DRY	4D1	22.08	22.26	
Hs	DRY	1D1	25.36	25.56	
HsA	IRRG	1A	3.02	3.05	
HnC3	IRRG	4A1	30.34	30.58	
Hs	IRRG	1A1	100.36	101.16	
HOMESITE	HOMESITE	HOMESITE	1.00	1.00	
SITE1	SITE1	SITE1	3.46	3.48	
Fm	IRRG	3A1	3.06	3.08	
2Hb	DRY	2D1	2.28	2.30	
ROAD	ROAD	ROAD	2.95	2.97	
W	GRAS	GRAS	2.08	2.09	
HnC3	GRAS	4G1	26.79	27.01	
			234.04	235.89	





- **Platte County, NE Assessor GIS**
  - Viewing basic info in GIS
  - Viewing CAMA/Appraisal Data files in GIS
- **Lyman County, SD Tax Equalization GIS**
  - Performing Land Value Calculations



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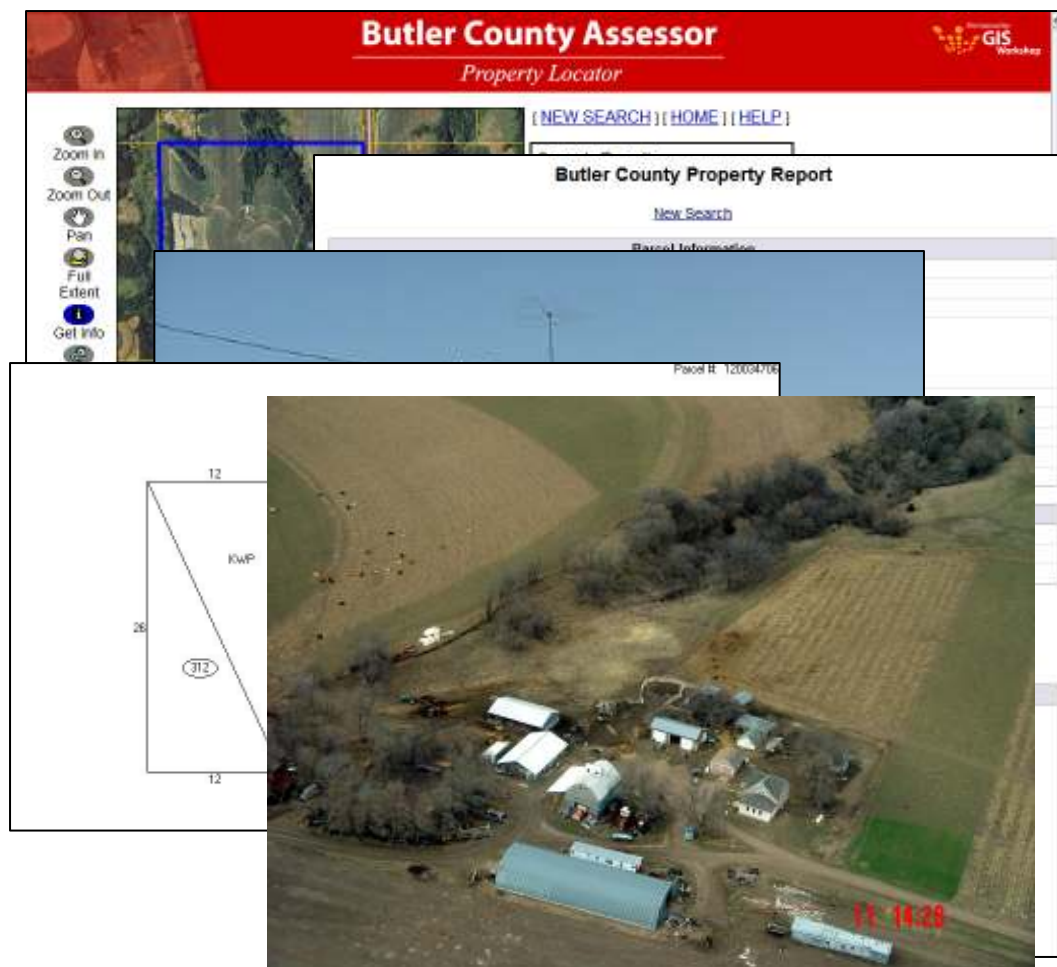
## Displaying & Reporting Data:

- Viewing Data on the Web
  - Published Maps
  - Internet Mapping Systems (IMS)
- Creating Maps
  - Cadastral replacement
  - Thematic Maps
  - Publishable Maps
- Viewing Imagery
  - Aerial & Oblique photos
- Creating Reports
  - Tabular & Graphical



## Putting your GIS on the web:

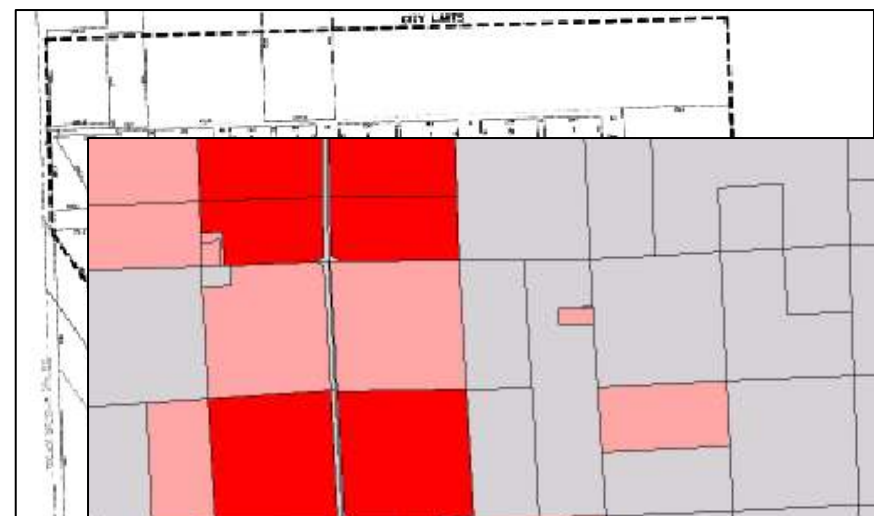
- Make your GIS transparent to the end user
- Bring Desktop GIS capabilities to the Web
- Simplifies the use of GIS for non-technical personnel
  - Now using GIS is as easy as using the Internet
- Reduce costs
  - Software
  - Personnel
  - Leveraging existing GIS information
- Incorporate Public & Private Information
  - Imagery
  - Purchased or Subscribed data





## Creating maps:

- Print New Cadastral Books
  - Only print the pages you need when you need them!
- Create Thematic Maps for evaluation and reporting
  - Sales trends over time
  - Parcels affected by Zoning changes
- Publish maps for the public
  - Voting districts & polling places





## Viewing Imagery:

- High resolution aerals
  - 1-2m color from FSA
  - Have 1' to 6" flown for specific areas
- Oblique imagery
  - Identify out buildings and taxable structures remotely
  - Improve compliance
  - Provide enhanced maps for law enforcement





- **Butler County, NE Assessor IMS**
  - Viewing Property information and Improvements on Leased Land (IOLL) online
  - Viewing Oblique imagery
- **Polk County, NE Assessor & Treasurer IMS**
  - Linking Assessment and Treasurer systems
- **Dawes County, NE Assessor IMS**
  - Performing Land Value Calculations Online

# GIS for Rural Tax Assessment

## *Creating your GIS*



## Creating your GIS – Next Steps:

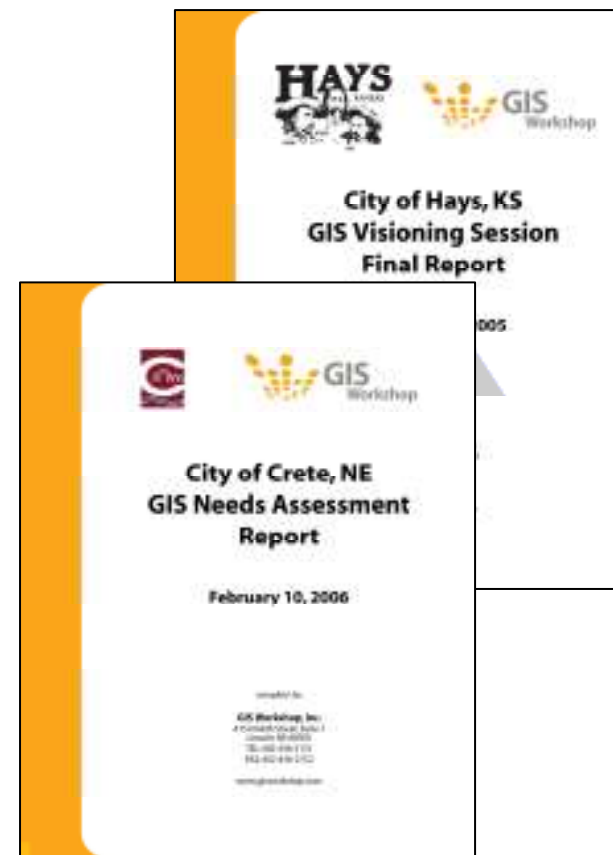
- **Planning & Scoping**
  - Needs Assessments – Identifying what you want
- **Preparing & Creating**
  - Designing and implementing the plan
  - Creating data
  - Training: Provide your staff with the tools to succeed
- **Maintaining**
  - Implementing procedures ensuring accuracy and completeness
  - Involving all participants – personnel are important!
- **Accessing the information**
  - Making data available (internally and externally)





## Proper Planning Improves Performance:

- **Planning**
  - Identify Participants
- **Outline**
  - Educate & Inform
    - What is GIS?
    - How can it help me?
  - Visioning
    - What do I want from these systems?
    - Improve ROI, processes, and budget
- **Timeline**
  - Determine timeframe
- **Surveys & Evaluations**
  - Questionnaires & Evaluations

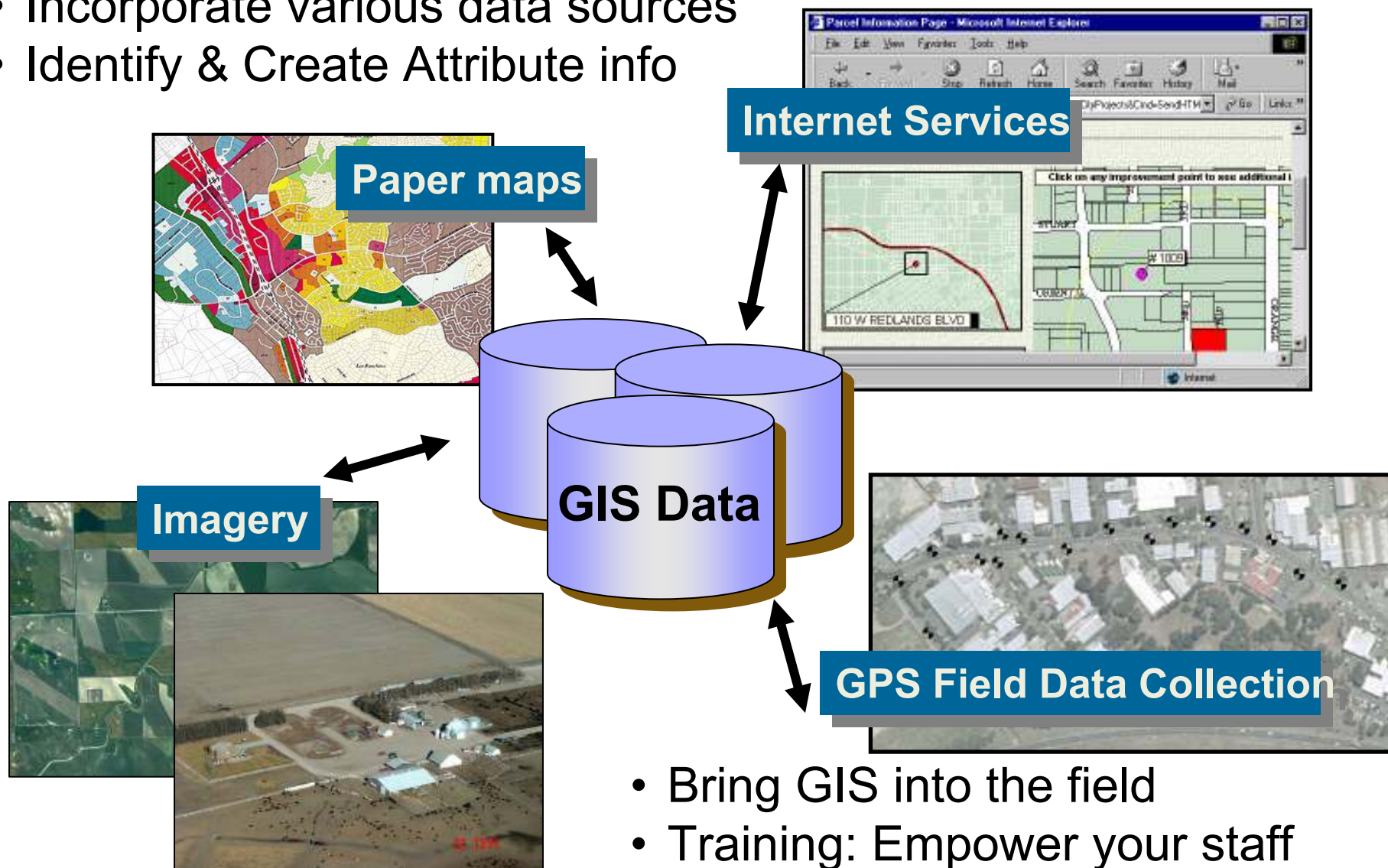


***Dream It, Plan it, Do It!***





- Incorporate various data sources
- Identify & Create Attribute info



- Bring GIS into the field
- Training: Empower your staff



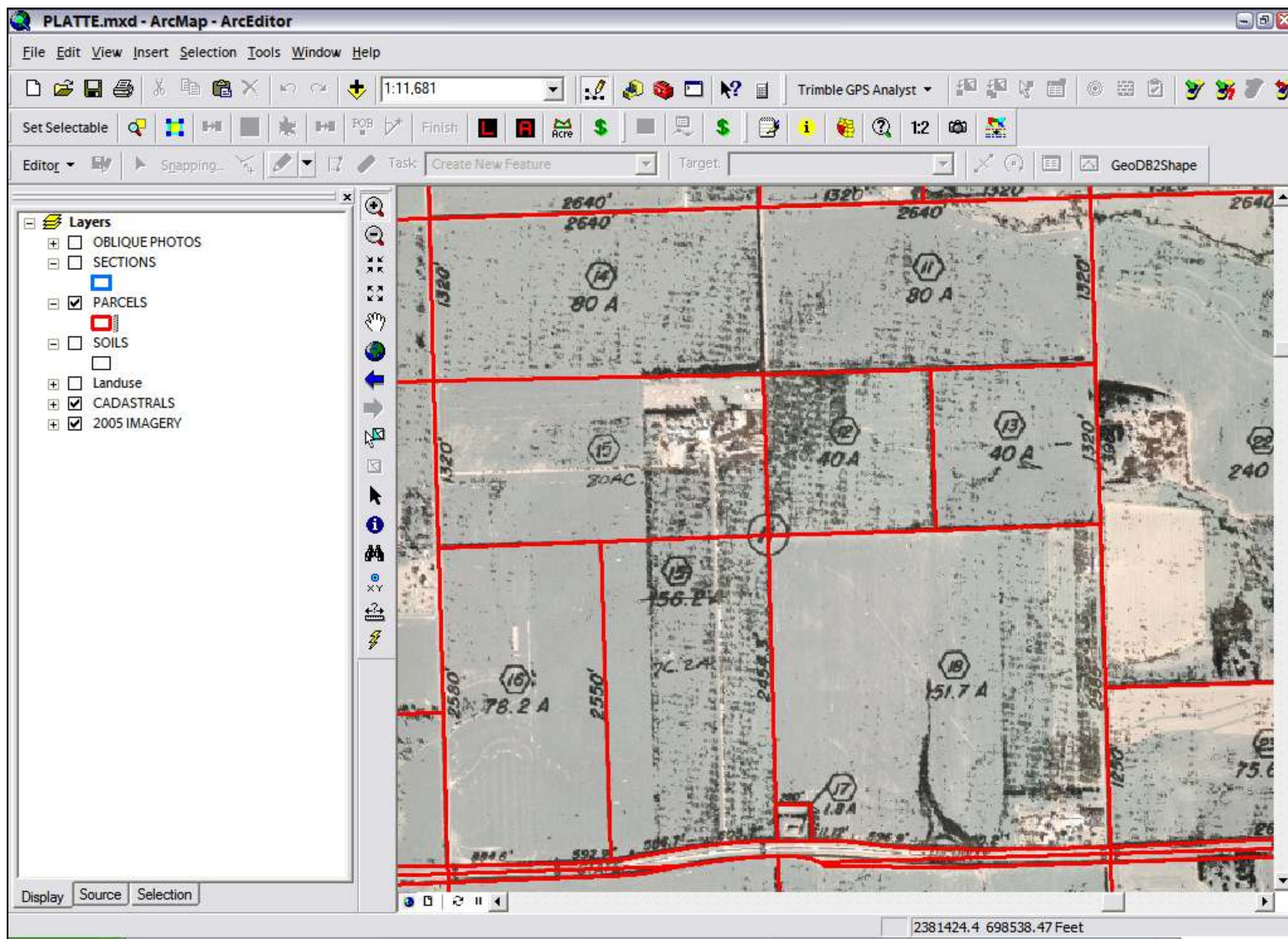


Use FREE DNR Imagery...

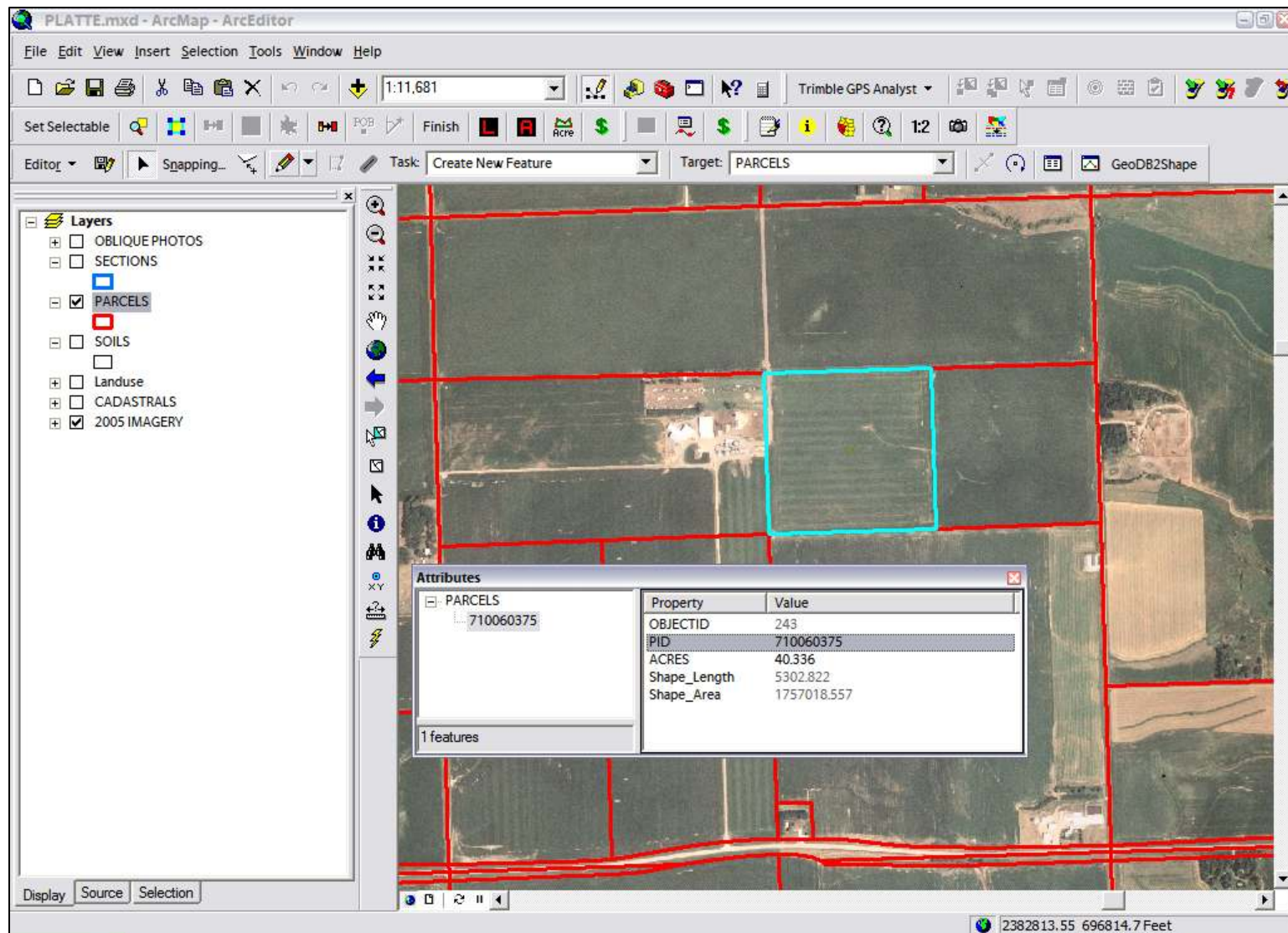


Update  
selected  
areas with  
Color high  
resolution  
digital imagery





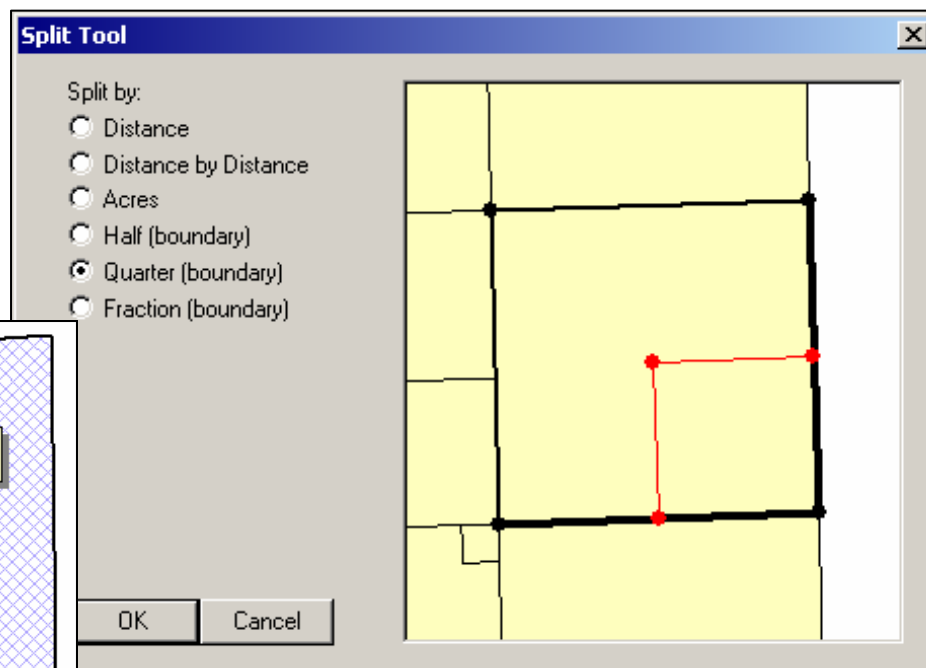
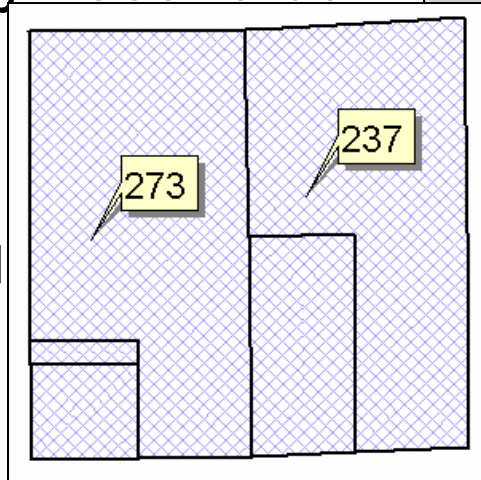






## Maintaining the GIS for top performance & accuracy

- Maintenance for a GIS means keeping its data up-to-date, accurate, and reliable.
- Data becomes out-of-date for many reasons:
  - new infrastructure
  - storm damage
  - changing user requirements
- Features may need to be:
  - added
  - modified
  - deleted
  - restructured





## Making Data available to others:

- **Internally**
  - Share data amongst peer groups
  - Allows all users to participate in departmental development
  - Improves Customer Service
- **Externally**
  - Provide information to the public or other departments
  - Requires no specialized training...its as easy as using the web!
  - Custom Solutions permit more advanced analysis and reporting

*Providing stakeholders with access*





# Any Questions???

**Thank you for your time  
and attention!!**



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